

## INTRA-ABDOMINAL TORSION OF THE ENTIRE GREAT OMENTUM.

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H. W.; man; aged twenty-five years; occupation, shoeshop employee; entered the Massachusetts General Hospital July 7, 1904. He had been taken ill seven days previously with abdominal pain and vomiting. The pain was general over the abdomen, but gradually became localized in the right side. The bowels did not move for three days. He did not vomit after the first day. He came to the hospital "because the belly was getting filled up."

Upon examination, it was found that the heart and lungs were normal; the abdomen was full. There was no hernia. The left side of the abdomen was comparatively soft. There was no general muscular rigidity. Upon the right side of the abdomen was felt a mass occupying the whole of the right iliac fossa and extending to the right hypochondrium and to the middle line. This mass was protected by muscular spasm. The mass was rather indefinite in outline. It was dull to percussion. It was not movable. It was not markedly tender. There was slight tenderness upon the right side upon rectal examination.

Operation eight days after the initial symptoms. A right semilunar incision revealed a slightly adherent omentum. The finger palpated a friable, dark, rough omentum with some old free blood in its meshes. The vessels of the omentum were thrombosed. The omentum was followed down into the pelvis, separated from the side of the rectum and the wall of the pelvis, and freed from the peritoneum over the iliac vessels and upward to the transverse colon. The bowel lying beneath the omentum was in every way normal. The transverse colon showed no abnormal appearances. In the right hypochondrium was a mass the size of a large orange. This mass, continuous with the omentum, was extremely firm, and proved to be the tightly twisted portion



Torsion of omentum.

of the great omentum lying close to the transverse colon. The omentum was twisted several times upon itself. The condition of the omentum as seen at the operation is well shown by Mr. Aitken in the accompanying illustration. The whole great omentum was tied off with silk in sections, just below the transverse colon, through normal omental tissue. The omentum was extremely friable and roughly granular. The appendix was discovered beneath the omentum, and, being somewhat œdematous, was tied off with silk, removed by the actual cautery, and buried with a purse-string suture. The abdominal wound was closed with through-and-through silkworm-gut sutures. The man made an uninterrupted recovery, and left the hospital nineteen days after entrance, apparently well.

The pathologist, Dr. W. H. Wright, reports that the appendix, six centimetres in length, was thickened, the peritoneum injected and roughened in places, showing dense, fibrous adhesions; the walls of the appendix were much thickened and œdematous, The lumen of the appendix contained considerable mucopurulent material. Diagnosis, a subacute appendicitis.

As regards the omental specimen, it consists of a mass of soft tissue, and presents the appearances of a great omentum in which the fat is abnormally large in amount. The specimen is twisted upon itself, probably one and one-third times. There is no fibrinous exudate or inflammatory tissue in and about the twisted portion. The blood-vessels of the specimen are generally filled with blood, and the whole tissue has a reddish color, as from congestion. There is no gangrene.

Before operation, this was thought to be simply a case of appendicitis, although not particularly characteristic of the onset of an attack, and the mass felt was supposed to be adherent omentum over an inflammatory area. The operation revealed an unusual condition. The ligatures below the transverse colon were placed fairly near together, as many large vessels required tying. In the removal of any portion of the omentum, as in large herniæ, it is wise to include a rather small amount of omental tissue in the ligature in order to insure absolute hæmostasis. The ligatures in this case were placed in sound omental tissue close to the transverse colon.

Torsion of the whole large omentum is extremely rare. Certain cases of torsion of parts of the omentum have been recorded. Almost all of these have been associated with hernia. Two instances of omental torsion unassociated with hernia are the cases of Noble (*American Journal of Obstetrics*, 1904, Vol. xlix) and of Eitel (*New York Medical Record*, May 20, 1899).

Noble's case was that of a woman, twenty-four years old, unmarried, who was thought to have an acute appendicitis. Operation was suggested and refused. Six days later, being no better, an abdominal incision discovered a normal appendix and a twisted process of omentum attached to the fimbriæ of the right Fallopian tube. Coagulation necrosis was complete in this portion of the omentum. The twisted process was removed. Recovery was complete.

Eitel's case was that of a heavy man, forty-four years old, with ascites. After tapping the abdomen twice and withdrawing several gallons of fluid, an abdominal incision discovered a twisted great omentum with greatly distended veins. The torsion was corrected by untwisting, and the omentum was spread out over the intestines in normal relation. No untoward symptoms appeared. The patient recovered.

I have carefully examined the literature of all reported instances of omental torsion, and in every case an abdominal hernia existed, excepting in these two cases and in the case reported for the first time in this paper.

Etiologically, these cases of torsion of the omentum are of interest. They may be arranged in four groups. First, those in which the omentum is found twisted and adherent in a hernial sac. Second, those in which the omentum lies twisted near to an empty hernial sac, the twisted omentum evidently having once occupied the sac. Third, those in which a hernia exists, and the twisted omentum is attached to some organ, but not apparently connected with the hernia. Fourth, those in which no hernia exists at all. It has generally been supposed that two points of more or less fixed attachment are necessary, around which fixed points the omentum is

rotated or swung until, by the passive congestion and coagulation necrosis, the twisted parts of the omentum become agglutinated, and the whole mass slightly adherent to neighboring organs.

Taxis has been assigned by Hochenegg as a cause of torsion of the omentum.

Martinaud regards the presence of a hernia in many of the cases as purely incidental, and not causative of the torsion in any sense. Payr (*Archiv für klinische Chirurgie*, 1902, Band lxxviii, S. 501) has experimentally produced torsion of the omentum in animals. He formed gas cysts in the omentum by inserting metallic magnesium into the omental tissue. This splits the  $H_2O$  of the tissues to form  $MgO_2 + H$ ; the  $MgO_2$  is absorbed, leaving cysts filled with H gas. These cysts are usually multilocular, the largest being about four to five centimetres in diameter. Omental torsion was caused because of the presence of these cysts in the omentum. He tried introducing material into the omentum which had less specific gravity than the abdominal organs generally, but which did not exert any upward force as the light gas cysts did. He tried cork, wood, paraffin, and alder pith. He obtained torsion of the omentum with all these. He tried implantation into the omentum of a piece of liver, but no torsion resulted, because adhesions formed. Payr thinks that, because the veins are longer and more tortuous than the arteries, when the veins are compressed by a kink of some kind, that they become turgid and full of blood. The arteries form a tense elastic cord. The congested omentum turns about this cord, and once started the twisting continues. He compares a distended appendix to the conditions described above, in which case the mesentery represents the tense cord. In conclusion, Payr writes:

It is important to distinguish between internal and external causes of torsion. Internal being brought about by conditions of growth and circulation. The conditions of growth of a tumor and the variations in weight thus caused play an important rôle in the etiology of torsion. The blood-vessels

play an important part in the etiology as suggested above. Payr demonstrated that omental torsion may be caused experimentally in the absence of hernia or adhesions, and these three cases of Noble, Eitel, and my own here reported confirm clinically the results of Payr's experimental work.

The appended references to literature contain the most important papers published.

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